

ABSTRACT

A process for laser processing an article, which comprises: heating the intended article to be doped with an impurity to a temperature not higher than the melting point thereof, said article being made from a material selected from a semiconductor, a metal, an insulator, and a combination thereof; and irradiating a laser beam to the article in a reactive gas atmosphere containing said impurity, thereby allowing the impurity to physically or chemically diffuse into, combine with, or intrude into said article.

The present invention also provides an apparatus for use in a laser processing process, characterized by that it is provided with an internal sample holder and a device which functions as a heating means of the sample, a window made of a material sufficiently transparent to transmit a laser beam, a chamber comprising a vacuum evacuation device and a device for introducing a reactive gas containing an impurity element, a laser apparatus operating in a pulsed mode to irradiate a laser beam to said chamber, and a means to move said chamber synchronously with the laser irradiation.